

**REMARKS**

Applicants have amended claims 56, 69-71, and 73-75 to positively recite silica nanoparticles. Claim 84 has been amended to positively recite nanoparticles selected from the group consisting of silica, alumina, and combinations thereof. Additionally, claim 77 has been amended to positively recite that the nanoparticles are alumina nanoparticles. Applicants have withdrawn this claim as there is currently no allowed generic claim.

Claims 56-63, 65-77, and 79-87 are currently pending in the present application, including independent claims 56, 76, and 84. Independent claim 56, for instance, is directed to a breathable film comprising a blend of a thermoplastic polymer, a filler, and silica nanoparticles. The silica nanoparticles have a diameter of less than about 500 nanometers and a negative first Zeta Potential from about -1 to about -50 millivolts. The silica nanoparticles are modified with a metal ion to form modified silica nanoparticles. The modified silica nanoparticles comprise a second Zeta Potential being at least about 5.0 millivolts higher than the negative first Zeta Potential.

**Claim Rejections – 35 U.S.C. § 103**

In the Office Action, previous claims 56-73 and 84-87, including independent claims 56 and 85 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent App. 2002/0004350 to Mormon et al. in view of U.S. Patent App. 2002/0151634 to Rohrbaugh et al. Rohrbaugh et al. is cited as allegedly disclosing Applicants' claimed nanoparticles and modified nanoparticles. Rohrbaugh et al. is directed to coating compositions for modifying surfaces. The Office Action alleges that Rohrbaugh et al. discloses silica nanoparticles. Furthermore, the Office Action alleges

that it would have been obvious to one of ordinary skill in the art to obtain the claimed zeta potential values. Applicants respectfully disagree.

Independent claim 56 requires silica nanoparticles. Independent claim 84 requires nanoparticles selected from the group consisting of silica, alumina, and combinations thereof. Rohrbaugh et al. fails to disclose or suggest such limitations. The Office Action points to ¶ [0046] of Rohrbaugh et al. to yield this limitation (i.e., silica nanoparticles). Applicants respectfully note that "silica" nanoparticles are formed from silica ( $\text{SiO}_2$ ). For example, Applicants disclose that a suitable silica nanoparticle is marketed under the tradename SNOWTEX® available from Nissan Chemical Industries. SNOWTEX®, for instance, is colloidal silica having a particle size range of 1-100 nanometers. In contrast, Rohrbaugh et al. discloses the use of silicate clay, specifically LAPONITE™. LAPONITE™ is a synthetic layered silicate that resembles the smectite mineral hectorite in both structure and composition. Rohrbaugh et al. discloses that LAPONITE™ is a lithium magnesium silicate having the formula  $[\text{Mg}_w\text{Li}_x\text{Si}_8\text{O}_{20}\text{OH}_{4-y}\text{F}_4]^z$  wherein w=3 to 6, x=0 to 3, y=0 to 4, and z=12-2w-x. ¶¶ [0057] – [0058]. Thus, Rohrbaugh et al. fails to disclose silica nanoparticles as required by Applicants' claims.

Independent claim 56 additionally requires that the silica nanoparticles comprise a negative first Zeta Potential from about -1 to about -50 millivolts and the modified silica nanoparticles comprise a second Zeta Potential being at least about 5.0 millivolts higher than said negative first Zeta Potential. As disclosed in the specification, the Zeta Potential refers to the electrical potential, or electrokinetic potential, that exists across the interface of all solids and liquids. The nanoparticles of independent claim 56 have a first Zeta Potential and a second Zeta Potential after adsorption of the metal ion onto

the nanoparticle. This relationship provides a measurement for determining the amount of adsorbed metal ions and a method for controlling the amount of odor adsorption.

Such a limitation can not be said to be obvious from Rohrbaugh et al. First, as noted above, Rohrbaugh et al. fails to disclose the claimed silica nanoparticles. Thus, the particles disclosed in Rohrbaugh et al. certainly can not be said to inherently comprise a negative first Zeta Potential from about -1 to about -50 millivolts. Additionally, a second Zeta Potential being at least 5.0 millivolts higher would not be obvious from the disclosure of Rohrbaugh et al. since the only mention of modifying nanoparticles is at ¶¶ [0066] – [0071] which disclose coating LAPONITE™ with functionalized charged molecules in order to enhance sheeting/wetting of the treated surface. On the contrary, Applicants modify the claimed nanoparticles in order to enhance adsorption of odorous compounds. One of ordinary skill in the art would not be motivated to modify the “hydrophilic enhancing” treatment of LAPONITE™ disclosed in Rohrbaugh et al. in order achieve an appropriate amount of metal ions adsorbed onto Applicants claimed nanoparticles to sufficiently absorb targeted odors.

Claims 76-77 and 81-83, including independent claim 76 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Morman et al. in view of Rohrbaugh et al. and further in view of U.S. Patent App. 2001/0051189 to Fernandez et al. Fernandez et al. is cited as allegedly disclosing nanoparticles comprising a positive Zeta Potential as claimed by Applicants in independent claim 76. First, Applicants restate their arguments with respect to independent claims 56 and 84 above. Fernandez et al. does not remedy these deficiencies. Second, Applicants respectfully submit that Fernandez et al. fails to disclose nanoparticles comprising a positive Zeta Potential from about 1 to about 70 millivolts.

As a preliminary matter, Applicants respectfully note that Fernandez et al. is directed to pharmaceutical compositions. Applicants respectfully submit that one of ordinary skill in the art would not look to pharmaceutical compositions useful for the delivery of high molecular weight compounds (see ¶ [0010]) in order to control odor in personal absorbent articles. At any rate, Fernandez et al. discloses nanoparticles with a positive electrical charge. Applicants respectfully submit that electrical charge may not be equated with Zeta Potential. For instance, as noted in Applicants' specification:

Nanoparticles are not generally ionic yet still have an overall electric Zeta Potential. "Zeta Potential" refers to the electrical potential, or electrokinetic potential, that exists across the interface of all solids and liquids. Naturally occurring chemical reactions on the surface of a nanoparticle result in the Zeta Potential of that nanoparticle and nanoparticles may have either positive or negative Zeta Potentials. Silica nanoparticles, for example, are tetrahedral complexes of silicon dioxide molecules. On the surface of the silica particles the silicon dioxide molecules can undergo chemical reactions forming silanol groups (SiOH) which react with other silanol groups to form siloxane bonds (Si-O-Si). The dehydration reactions of the silanol groups to form the silanol bond and the reverse reactions result in a negative Zeta Potential and allow positively charged metal ions to adsorb onto the silica. Pg. 11, line 30 – pg. 12, line 14.

As such, the disclosure of Fernandez et al. of nanoparticles with a positive electrical charge may not be said to anticipate nanoparticles comprising a Zeta potential between about 1 and about 70 millivolts.

Thus, Applicants submit that independent claims 56, 76, and 84 define over the references either alone or any in proper combination. Furthermore, Applicants respectfully submit that, at least for the reasons indicated above, the dependent claims 55-75, 77-83, and 85-87 also patentably define over the reference(s) cited. The patentability of the dependent claims, however, certainly does not hinge on the patentability of the independent claims.

**Double Patenting**

As a final matter, the provisional rejection of various claims over co-pending Application No. 10/686,933 for obviousness-type double patenting is noted. Additionally, the rejection of various claims over U.S. Patent No. 7,141,518 for nonstatutory obviousness-type double patenting is noted. Applicants agree to submit terminal disclaimers for the above references, if necessary, at a time when the present application is otherwise in condition for allowance.

In summary, Applicants respectfully submit that the present application is in complete condition for allowance and favorable action, therefore, is respectfully requested. Examiner Sasan is invited and encouraged to telephone the undersigned, however, should any issues remain after consideration of this Amendment.

Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully requested,

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